

AMENDMENTS TO THE CLAIMS:

Please amend claims 1, 4 and 5 and add newly written claim 6 as follows.

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (currently amended) A micro electromechanical system switch including a fixed contact ~~(24, 42)~~ and a moveable contact ~~(35)~~ on an armature ~~(30)~~ characterised by comprising:
electrodes ~~(22, 34)~~ associated with both the fixed and moveable contacts for providing an electrostatic switch operation;
piezoelectric material ~~(37)~~ with associated electrodes ~~(36, 40)~~ for bending the armature ~~(30)~~ upon application of electric voltages and providing a piezoelectric switch operation;
the armature being of curved shape which is bent away from the fixed contact ~~(24)~~ when in a switch open condition with zero applied voltage;
the arrangement being such that operation of the piezoelectric material ~~(37)~~ bends the armature towards the fixed contact ~~(24)~~ and bends the moveable contact ~~(35)~~ into a substantially parallel alignment with the fixed electrode for clamping of the fixed and movable contacts under electrostatic force from the electrostatic electrode ~~(22, 34)~~.
2. (original) The switch of claim 1 wherein the fixed contact are transmission line contacts and the moveable contact is a switch contact for switching parts of a microwave system.
3. (original) The switch of claim 2 wherein the moveable contact is a switch contact with at least two protuberances for connecting two electrically isolated parts of a signal line together.

4. (currently amended) A method of providing a micro electromechanical system switch having a movable armature ~~(30)~~ mounted on and separated from a substrate ~~(21)~~, the method including the steps of:

providing a substrate ~~(21)~~ carrying a fixed metal layer forming a fixed contact ~~(24)~~, electrostatic switch actuation electrodes ~~(22)~~ and electrical interconnects ~~(25, 26)~~;

providing an armature having a mechanical layer ~~(38)~~ carrying at least one movable switch contact ~~(35)~~ for electrical switching, an electrode ~~(34)~~ electrostatic actuation, and carrying a layer of piezoelectric material ~~(37)~~ between two electrodes ~~(36, 40)~~,

the layers comprising the switch having variable in-plane stress and/or stress gradient across their thickness for causing the armature in its free state to adopt a curved condition bending away from the substrate;

the arrangement being such that operation of the piezoelectric material ~~(37)~~ bends the armature ~~(30)~~ towards the substrate ~~(20)~~ and bends the moveable electrostatic actuation electrode ~~(34)~~ into a substantially parallel alignment with the fixed electrostatic electrode ~~(22)~~ for clamping of the moveable switch contact ~~(35)~~ to the fixed switch contact ~~(24)~~ under electrostatic force.

5. (currently amended) The method of ~~claim 1 wherein~~ claim 4 wherein the fixed metal layer forms a part of a coplanar waveguide transmission line and the fixed contact is a part of this transmission line.

6. (new) A micro electromechanical system switch mounted on a substrate, said switch comprising:

a moveable armature mounted above said substrate, said armature including a piezoelectric layer, said piezoelectric layer curved away from said substrate, said piezoelectric layer including associated piezoelectric electrodes, wherein said piezoelectric electrodes, when energized, cause said piezoelectric layer to move closer to said substrate position;

a moveable switch contact located on said armature;

an electrostatic electrode located on said armature;

an electrostatic electrode located on said substrate and corresponding to said armature electrostatic electrode; and

a fixed switch contact located on said substrate and corresponding to said moveable switch contact on said armature, wherein application of an electrostatic voltage to said electrostatic electrodes causes electrostatic attraction between the electrostatic electrodes thereby moving said armature towards said substrate until said moveable switch contact on said armature makes electrical contact with said fixed switch contact on said substrate and latching said armature in said electrical contact position.